DANA SPICER®
Off-Highway Products

Service Manual

Axle
S20BZ122-1

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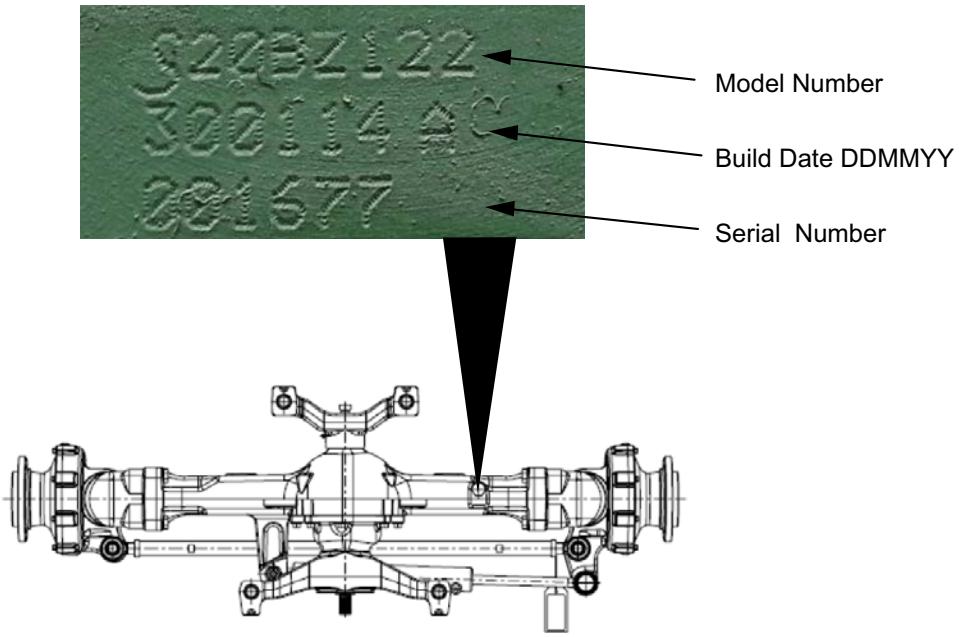
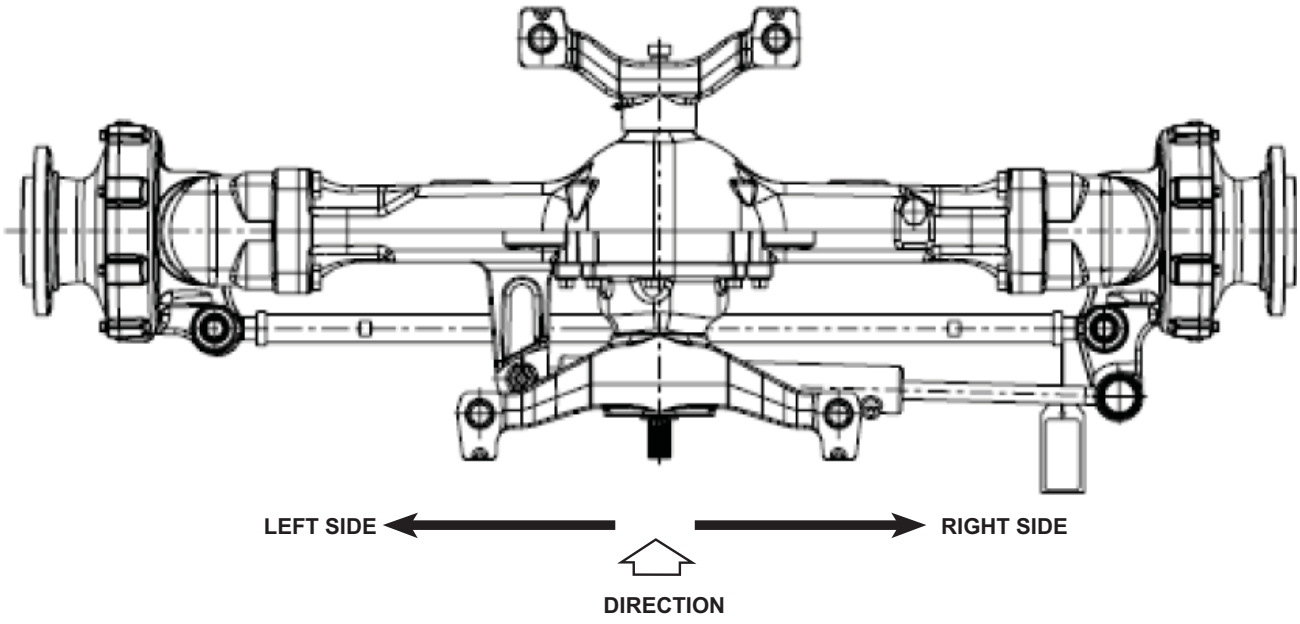
MAINTENANCE & LUBRICATION

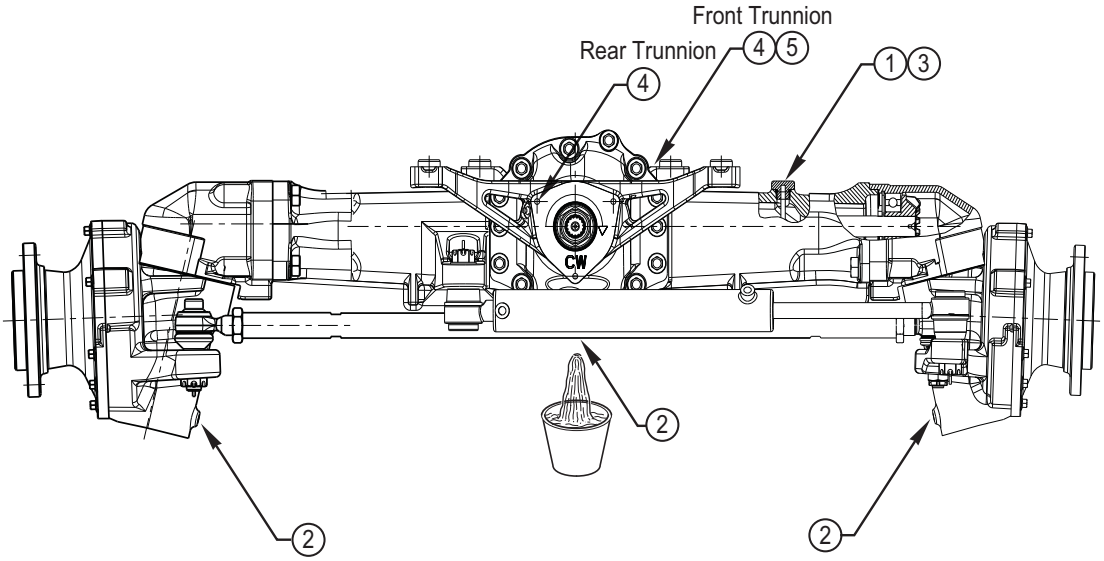
Data Plate



Definition of Viewpoints



Maintenance Points



1 - Oil fill plug

2 - Oil drain plug

3 - Check level plug

4 - Grease zerk

5 - Front trunnion thrust bolt

Maintenance Intervals

Operation	Component	Frequency	Lubricant
Oil Check Levels	Axle	Every 50 hours check level on dipstick	J20C
Oil Change	Axle	Initially after 100 working hours Every 600 hours	
Greasing	Front & Rear Trunnion	Dry land applications - Weekly or every 50 hours whichever is earlier Wet land applications - Daily	NLGI 3EP
Tightening	Front Trunnion Bolt	Every 600 hours verify: Thrust bolt torque - 11-22 lbs. ft [15-30 N•m] Jam nut - 129-147 lbs. ft [175-200 N•m]	--
	Wheel Nuts	Initially after 10 working hours Every 200 hours	

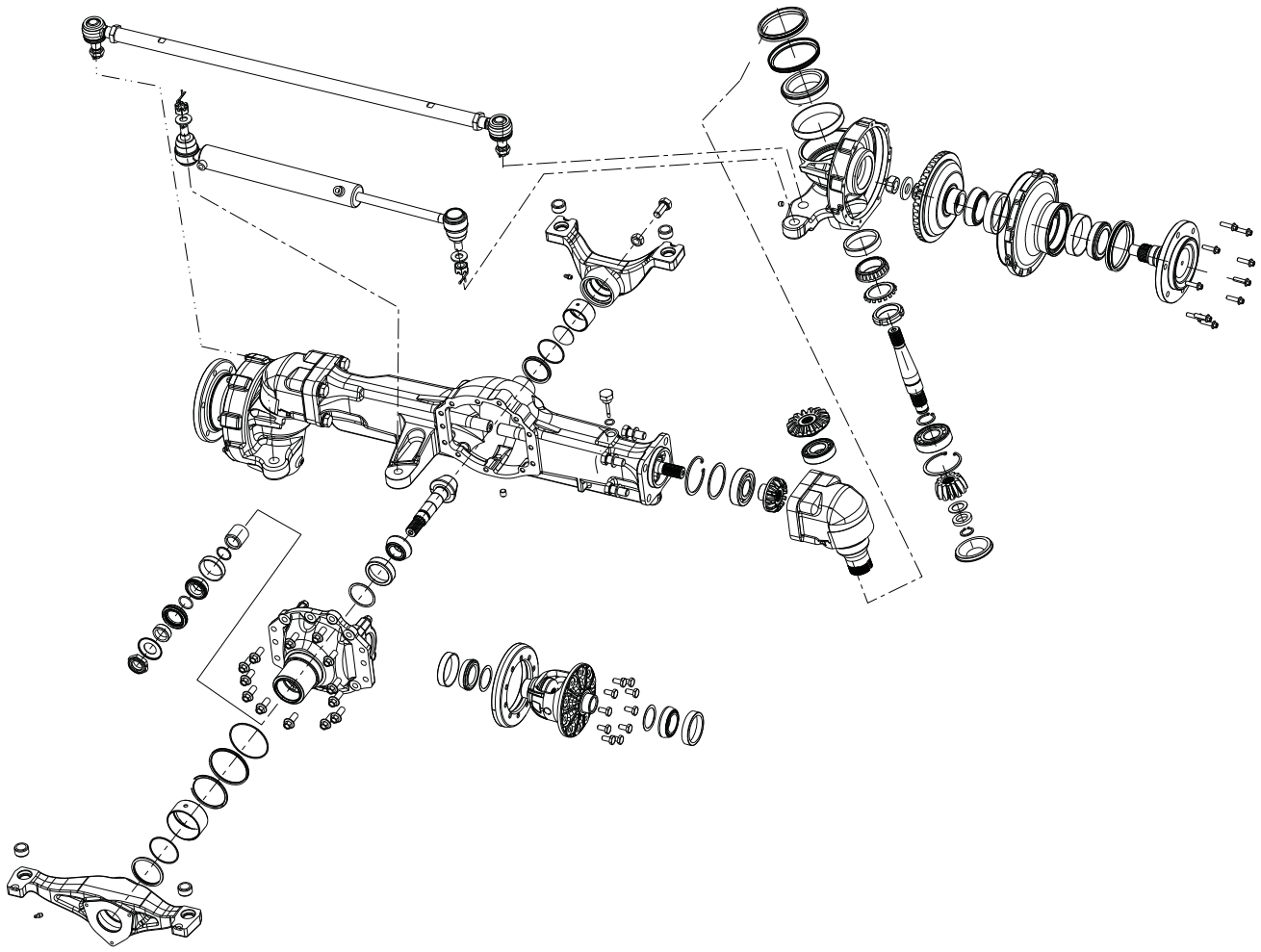
Safety Precautions

1. During all operations described in this manual, the axle should be fastened onto a trestle, while the other
   parts mentioned should rest on supporting benches.
2. When removing one of the arms, an anti-tilting safety trestle should be placed under the other arm.
3. When working on an arm that is fitted on the machine, make sure that the supporting trestles are correctly positioned and that the machine is locked lengthways.
4. Do not admit any other person inside the work area; mark off the area, hang warning signs and remove the ignition key from the machine.
5. Use only clean, quality tools; discard all worn, damaged, low quality or improvised wrenches and tools. Ensure that all dynamometric wrenches have been checked and calibrated.
6. Always wear gloves and non-slip rubber shoes when performing repair work.
7. Should you stain a surface with oil, remove marks straight away.
8. Dispose of all lubricants, seals, rags and solvents once work has been completed. Treat them as special waste and dispose of them according to the relative law provisions obtaining in the country where the axles are being overhauled.
9. Make sure that only weak solvents are used for cleaning purposes; avoid using turpentine, dilutants and toluol, xylol-based or similar solvents; use light solvents such as Kerosene, mineral spirits or water-based, environment friendly solvents.
10. For the sake of clarity, the parts that do not normally need to be removed have not been reproduced in some of the diagrams.
11. For agricultural axles, the terms RIGHT and LEFT refer to the position from the operator's seat. For construction axles, the terms RIGHT and LEFT refer to the position outside facing the machine (with the input drive facing forward).
12. After repair work has been completed, accurately touch up any coated part that may have been damaged.
13. Follow all safety instructions in the Original Equipment Manufacturer (OEM) manual that came with the vehicle.

DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury.
NOTICE	Indicates a situation which, if not avoided, may result in if not avoided, may result in damage to components.

DISASSEMBLY & REASSEMBLY

Exploded View



Driveshaft & Hydraulic Line Removal

1. Disconnect the steering cylinder hydraulic lines.
2. Remove the spring pin from the driveshaft splined connector.
3. Support the driveshaft and slide the splined connector toward the center of the driveshaft to remove the driveshaft from the machine.

Axle Removal

FIGURE 1:

1. Remove axle completely, supporting the axle with a hoist and remove front wheels. Place the axle on workbench or blocks to disassemble.

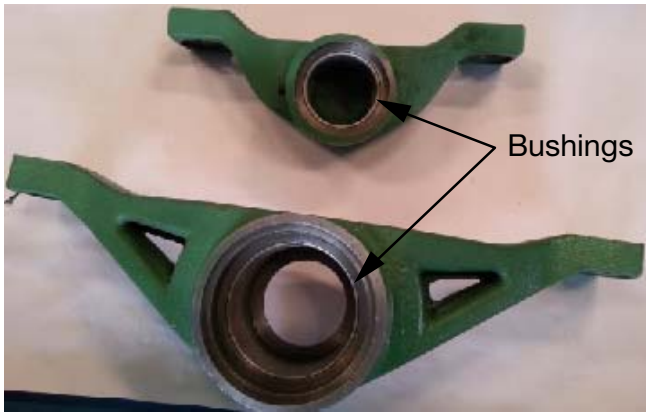


FIGURE 2:

2. Remove front and rear trunnions. Inspect axle pin bushings and replace, if required.

NOTE:

When removing the rear trunnions also remove the inverted v-ring, thrust washer, and the v-ring on the housing.

When removing the front trunnion, also remove the v-ring and thrust washer.

Steering Cylinder Removal

FIGURE 3:

1. Remove cotter pins, castle nuts, and washers.

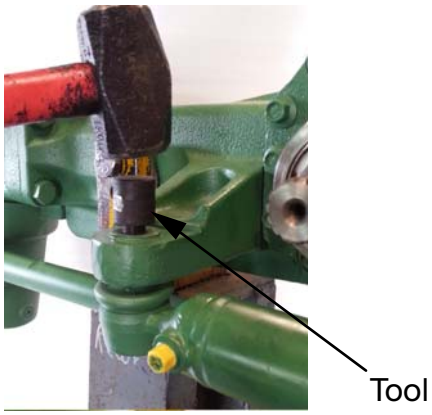


FIGURE 4:

2. Remove steer cylinder.

NOTE:

Cylinder ball end studs are tapered. Use a Steering Cylinder Taper Removal Tool, page 29 to avoid damaging threads if cylinder is to be reused.

Tie Rod Removal

FIGURE 5:

1. Remove the cotter pin and the castle nut from tie rods.

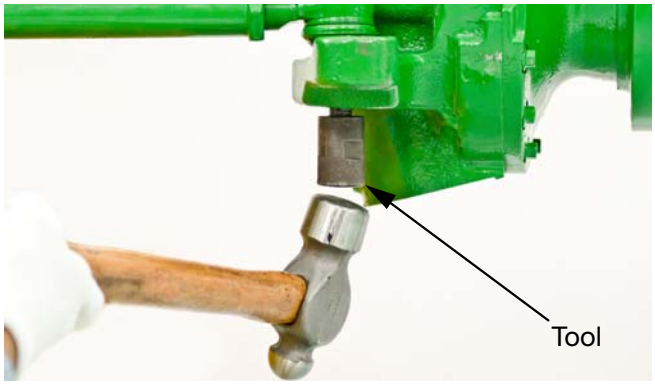


FIGURE 6:

2. Using a tie rod end removal tool, remove tie rod ends from knuckles.

NOTE:

Tie rod ball end studs are tapered. Use a Tie Rod End Taper Removal Tool, page 30 to avoid damaging threads if tie rod is to be reused.

NOTE:

One of the tie rod ends and jam nut has left-hand threads.

Drain Plug Removal

FIGURE 7:

1. Remove plugs and drain oil from final drive housings and main axle.

Final Drive Cover Disassembly

FIGURE 8:

1. Remove capscrews from final drive cover.

FIGURE 9:

2. Separate final drive cover and output shaft from final drive housing.

NOTE:

It may be necessary to pry the cover from the housing using the two pry bars on each side of the cover.

FIGURE 10:

3. Loosen output shaft nut and remove nut, plate retainer, and shim.

⚠CAUTION

The retaining nut on the output shaft is a special “torque prevailing” nut. Always replace this nut. Do not reuse. Never tighten a torque prevailing nut with an impact wrench. Always use a torque wrench to correctly tighten torque prevailing nuts.

Final Drive Cover Disassembly

FIGURE 11:

4. Remove 41T bevel gear from output cover.

FIGURE 12:

5. Remove the output cover.

FIGURE 13:

6. Remove face seal from the output cover and the output shaft.

FIGURE 14:

7. If necessary, press bearings off of bevel gear and output shaft.

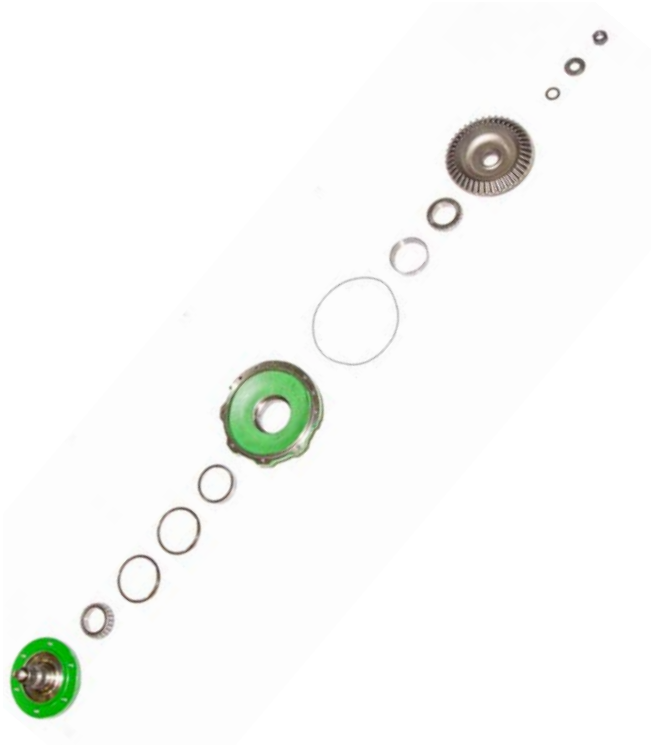
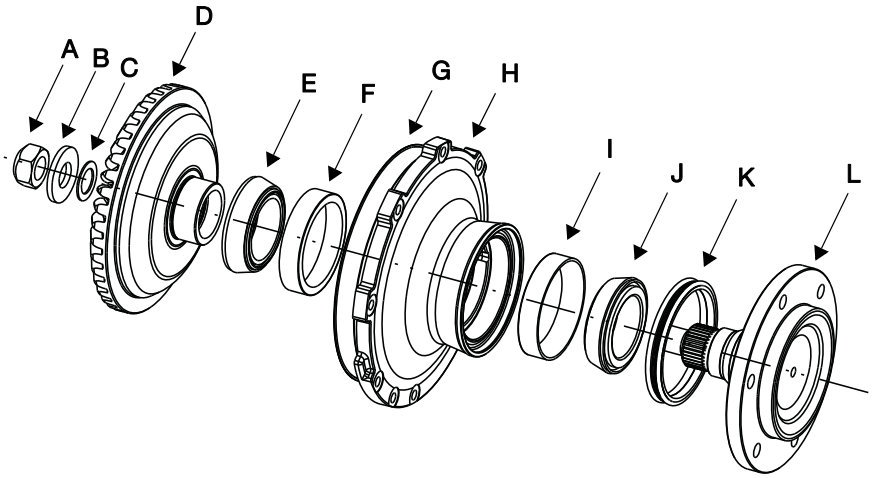


FIGURE 15:

8. Clean and inspect all parts replacing any damaged components.

Final Drive Cover Installation

A- Spindle Nut
B- Retainer Plate
C- Shim
D- Bevel Gear
E- Bearing Cone
F- Bearing Cup
G- O-ring
H- Final Drive Cover
I - Bearing Cup
J- Bearing Cone
K- Face Seal
L- Output Shaft



1. Install bearing cups (F&I) to the final drive cover (H).
2. Install the bearing cone (J) to the output shaft (L).

FIGURE 16:

3. Using the Face Seal Tool, page 25, install the face seal (K) on the final drive cover (H) and output shaft (L). (See “Face Seal Installation”, on page 14, for cleaning of face seal.)
4. Install the final drive cover (H) to the output shaft (L).
5. Install the bearing cone (E) to the bevel gear (D).
6. Install the bevel gear (D) to the final drive cover and output shaft assembly (H&L).
7. Install new o-ring (G) on final drive cover (H).
8. To adjust bearings:
   a. To ensure proper seating of the bearing, roll and oscillate the 41T gear (D).
   b. To select shims (C), start with old shim and install additional shims, as required, on the output shaft.

NOTE:

For initial assembly and measurements, assemble final drive with the USED spindle nut. Do not use a NEW spindle nut until final assembly as this nut is torque prevailing.

FIGURE 17:

   c. Assemble the shim, retainer plate, and USED spindle nut to output shaft and tighten the nut to 330–360 lbs. ft. [447.2–488 N•m].
   d. Using the Final Drive Bracket Tool, page 31, verify the rolling torque of the final drive cover is 54–76 lbs. in. [6.1-8.6 N•m].
   e. If the rolling torque is not correct, reselect shims (C) to achieve the correct rolling torque.
   f. If the rolling torque is correct, remove the USED spindle nut. Using a NEW spindle nut (B), apply Loctite 272 to the threads and tighten nut to 330–360 lbs. ft. [447.2–488 N•m].

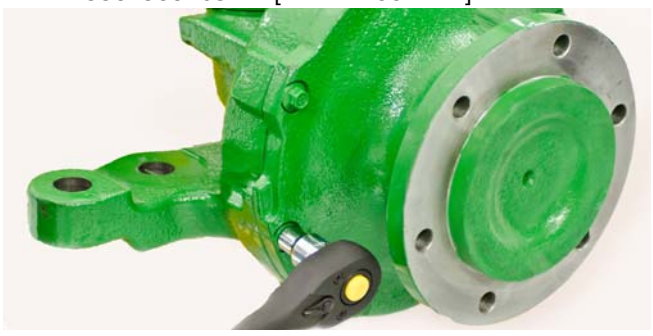


FIGURE 18:

9. Install final drive cover to knuckle housing tightening capscrews to 22–28 lbs. ft. [30–38 N•m].

Drop Shaft Disassembly

FIGURE 19:

1. Carefully remove welch plug from knuckle housing.

FIGURE 20:

2. Remove snap ring from drop shaft.

FIGURE 21:

3. Remove washer and shim(s) from drop shaft. Save all shim(s) between the washer and bevel gear.

FIGURE 22:

4. Remove bevel pinion from drop shaft.

FIGURE 23:

5. Remove snap ring from knuckle housing.

FIGURE 24:

6. Remove drop shaft and bearing from knuckle housing.

FIGURE 25:

7. Remove the snap ring and bearing from the drop shaft.

FIGURE 26:

8. Inspect all drop shaft parts and replace any unserviceable components.

Drop Shaft Assembly & Installation

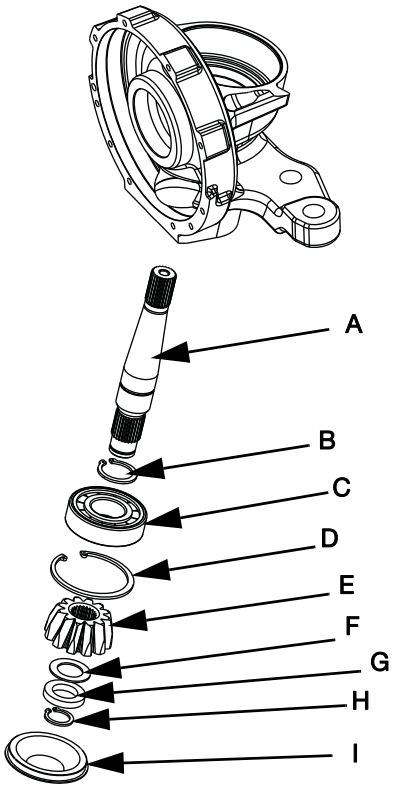


FIGURE 27:

1. Install snap ring (B) and bearing (C) on drop shaft (A).
2. Install drop shaft (A) assembly in final drive housing.
3. Install internal snap ring (D) in final drive housing.
4. Install bevel pinion (E), any shim(s) (F), washer (G), and snap ring (H) on drop shaft.
5. Install final drive cover assembly to knuckle housing.
6. To set lower final drive backlash, shim (F) the bevel gear end play to 0.025–0.030 in. [0.64–0.76 mm].

FIGURE 28:

7. The end play sets backlash to 0.005–0.007 in. [0.13–0.18 mm].

FIGURE 29:

8. Apply Loctite 380/480 to a new welch plug (l) and install to knuckle housing using the Welch Plug Driver Tool, page 32.

⚠CAUTION

The welch plug should always be replaced. Do not reuse.

Knuckle Housing Removal

1. Remove final drive cover. (See “Drain Plug Removal”, on page 6.)
2. Remove final drive drop shaft. (See “Drop Shaft Disassembly”, on page 9.)

3. Straighten tabs on star lockwasher that secure spanner nut in slot. Loosen the spanner locknut using the Final Drive Spanner Nut Socket, page 28.

FIGURE 30:

4. Remove spanner locknut, star lockwasher, and bearing cone.

FIGURE 31:

5. Remove knuckle housing from shoulder housing.

FIGURE 32:

6. Remove face seal, face seal cup, and bearing cone. Press off bearing cups from knuckle, if necessary. Clean and inspect all parts replacing any damaged components.

Knuckle Housing Installation

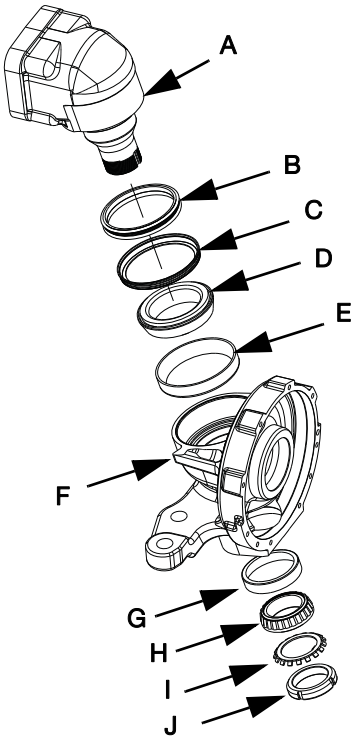


FIGURE 33:

7. Install bearing cups (E &G) into knuckle using appropriate drivers.

FIGURE 34:

8. Install bearing cone (D) into knuckle housing
9. Install face seal cup (C) using the Face Seal Cup Driver, page 27.

⚠CAUTION

The face seal cup (C) should always be replaced. Do not reuse.

FIGURE 35:

10. Install face seal (C) using the Face Seal Tool, page 25. (See “Face Seal Installation”, on page 14.)

FIGURE 36:

11. Lubricate knuckle housing.

FIGURE 37:

12. Install knuckle housing on shoulder assembly.
13. Lubricate and install bearing cone (H).
14. Install star lockwasher (I). Add Loctite 277 to spanner nut (J) threads and install using Final Drive Spanner Nut Socket, page 28, and torque to 66-74 lbs. ft. [90-100 N•m].
15. Rock knuckle housing (F) back and forth to seat bearing rollers and re-torque spanner nut to 66-74 lbs. ft. [90-100 N•m]. Repeat this step a minimum of 4 times until the nut will no longer advance.

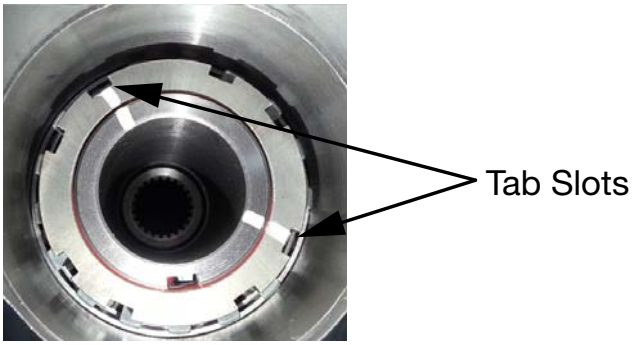


FIGURE 38:

16. Fold two tabs of the star lockwasher fully into the spanner nut slots to lock nut into place. If tabs are not aligned with spanner nut slots, advance nut slightly until two tabs align. Ensure tabs are squarely seated into slots.

⚠CAUTION

The star lockwasher (I) should always be replaced. Do not reuse.

17. Install drop shaft. (See “Drop Shaft Assembly & Installation”, on page 10.)
18. Install final drive cover. (See “Final Drive Cover Installation”, on page 8.)

Face Seal Installation

⚠CAUTION

- The face seal cup should always be replaced. Do not reuse.
- Replace damaged seals. If metal face seals are damaged, the face seal o-rings should also be replaced.
- Clean metal face seal rings with a non-petroleum based solvent.

1. Housing components that contact the rubber seal must be free from foreign material (oil, grease, dirt, metal chips, dust or lint particles, etc.) before installing the seal. This should be done using a lint-free wipe and a non-petroleum based solvent. Dry with a clean wipe.
2. Clean face seal o-ring with isopropyl alcohol spray prior to installation to remove any debris.

NOTE:

Sealing rings must be handled with care. Lapped sealing faces must not be damaged, scratched, or contaminated with dirt or grease.

3. When installing the rubber o-ring on the seal ring, ensure that it is uniformly seated on the retaining lip and is not twisted.

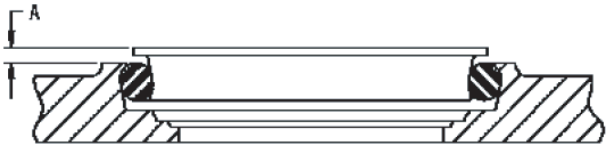


FIGURE 39:

FIGURE 40:

4. Place the seal in the Face Seal Tool, page 25, and locate this assembly squarely against the top of the conical seal.

FIGURE 41:

5. Spray the o-ring and seat with isopropyl alcohol to act as a lubricant to the o-ring.

FIGURE 42:

6. Use sudden and even pressure to push in the seal and ensure the retaining lip is not twisted or pinched.
7. The sealing ring face should be parallel to the conical seal face within 0.50 mm (see Figure 39).
8. After installing the seal halves, wipe both metal sealing faces clean with a lint-free cloth.

NOTE:

Metal face seals should be replaced when the distance between the seal inner diameter and seal contact band is less than 50% of the distance between the seal inner diameter and the outer diameter.

9. Then apply a coat of clean MS8[1] oil to the metal seal faces with a lint-free applicator. The oil must not wet surfaces other than the sealing faces.
10. Clean the metal surfaces with lint-free cloth.

1 MS8 oil is mineral-based oil ranging from 10W to 90W.

Shoulder Housing Removal & Disassembly

1. Remove knuckle housing. (See “Knuckle Housing Removal”, on page 11.)

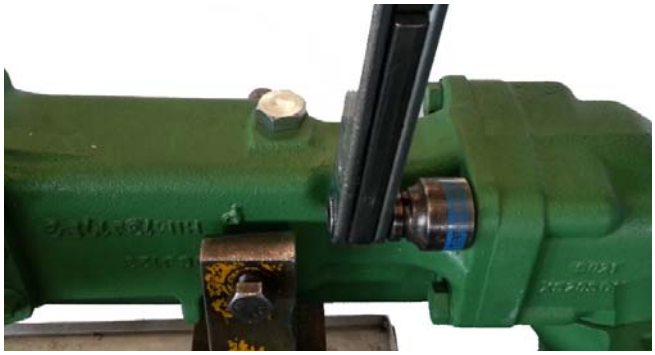


FIGURE 43:

2. Remove four capscrews fastening shoulder housing to axle housing.

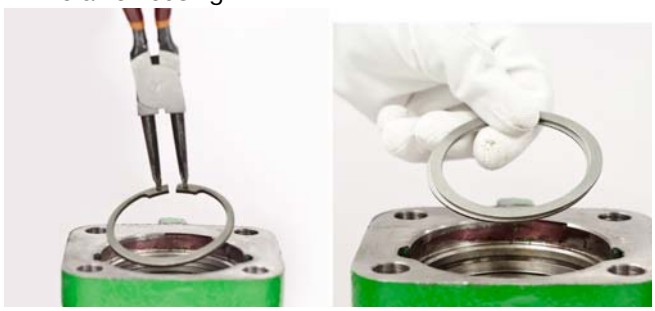


FIGURE 44:

3. Remove the internal snap ring and any shim(s) from shoulder housing.

FIGURE 45:

4. Remove bearing and upper shoulder 12T gear assembly from shoulder housing.

NOTE:

The bearings are pressed onto the gears, and the assemblies are slip fit into the housing.

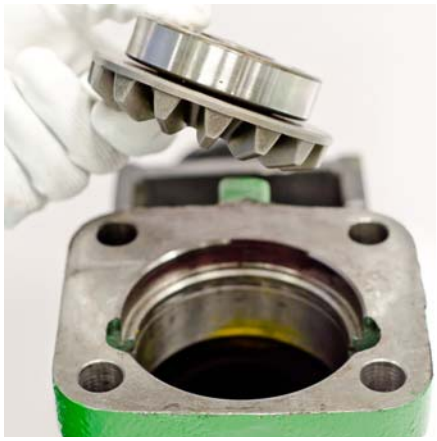


FIGURE 46:

5. Remove bearing and lower shoulder 15T gear assembly from shoulder housing.

FIGURE 47:

6. If necessary, press off gear from bearings. Clean and inspect all parts replacing any damaged components.

Shoulder Housing Assembly

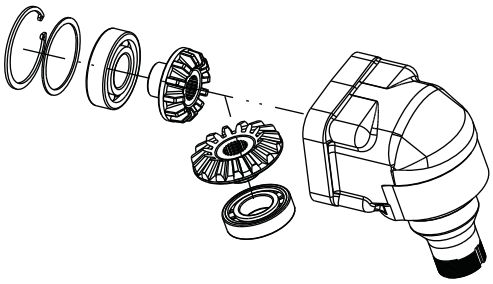


FIGURE 48:

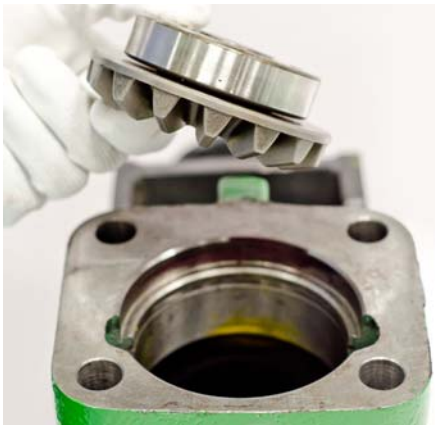


FIGURE 49:

1. Install bearing and lower shoulder 15T gear assembly into shoulder housing.

FIGURE 50:

2. Install bearing and upper shoulder 12T gear assembly into shoulder housing.

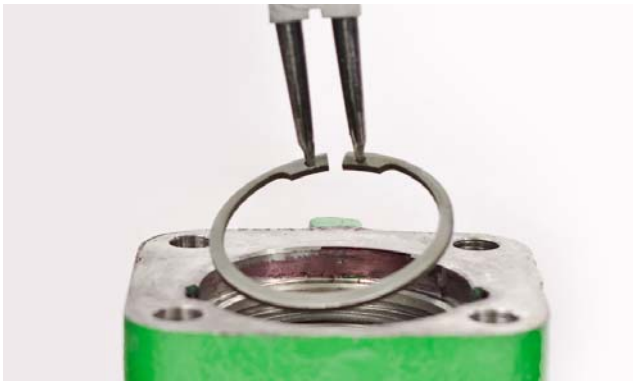


FIGURE 51:

3. Install internal snap ring to shoulder housing.

NOTE:

Do not install shims (B) until backlash measurements are taken.

FIGURE 52:

4. Measure end play of the upper shoulder gear.
   To set the end play:
   a. Measure distance between the bearing and the snap ring at several locations.
   b. Assemble shims such that end play is within 0.006–0.011 in. [0.15–0.28 mm]. This will ensure backlash is 0.004–0.008 in. [0.10–0.20 mm].

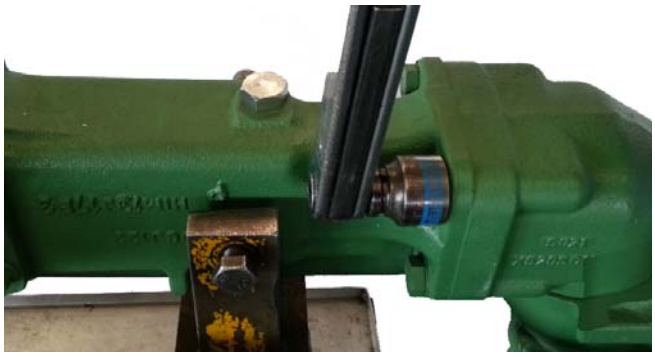


FIGURE 53:

5. Apply Loctite 515 to mating surfaces of the axle and shoulder housing.

NOTE:

Bolts used to fasten shoulder housing to axle housing are special bolts and should be replaced after disassembly.

Washers used to fasten shoulder housing to axle housing are special hardened washers.

6. Apply Loctite 262 to the threads and install capscrews fastening the shoulder housing to the axle housing. Tighten the four capscrews to 210.2–231.5 lbs. ft. [285–314 N•m].

Carrier Removal & Disassembly

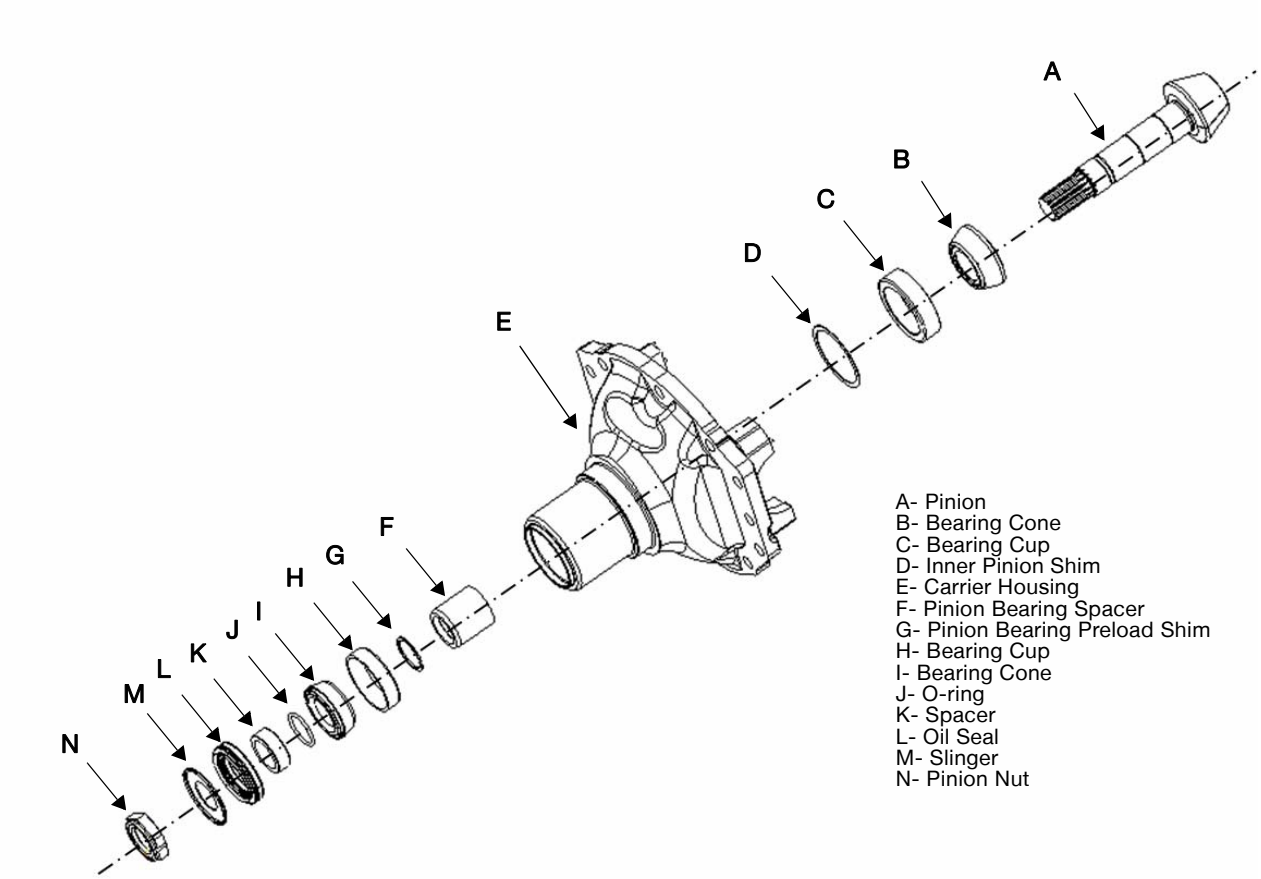


FIGURE 54:

1. Drain oil from front axle housing and both final drives.
2. Before removing the carrier, remove the driveshaft (see page 4), axle (see page 5), steering cylinder (see page 5), tie rods (see page 6), right-hand and left-hand wheel end assemblies, and axle shafts.
3. Remove capscrews fastening the carrier housing to the axle housing and remove carrier assembly.
4. Mark bearing caps and carrier housing to assure they are assembled in their original positions.
5. Remove capscrews from the bearing caps.
6. Remove differential assembly from carrier housing.

NOTE:

The differential assembly and internal parts come as an assembly. If any damage is apparent, there is no need to disassemble the case, as the whole assembly must be replaced.

7. Remove ring gear capscrews.
8. Remove the ring gear from the differential case.
9. Clean and inspect all parts and check parts for wear.
10. Replace any unserviceable parts.
11. Remove pinion nut. Do not discard nut at this time.

⚠CAUTION

The pinion nut is a special nylock nut. Always replace this nut. Do not reuse.

Never tighten a nylock nut with an impact wrench. Always use a torque wrench to correctly tighten nylock nuts.

12. Remove pinion from carrier housing.

NOTE:

The ring gear and pinion gear are serviced as an assembly. If either the ring gear or pinion has wear or damage, both must be replaced.

13. Disassemble pinion shaft assembly.
14. Clean and inspect all parts and check parts for wear.
15. Replace any unserviceable parts.

Carrier Assembly & Installation

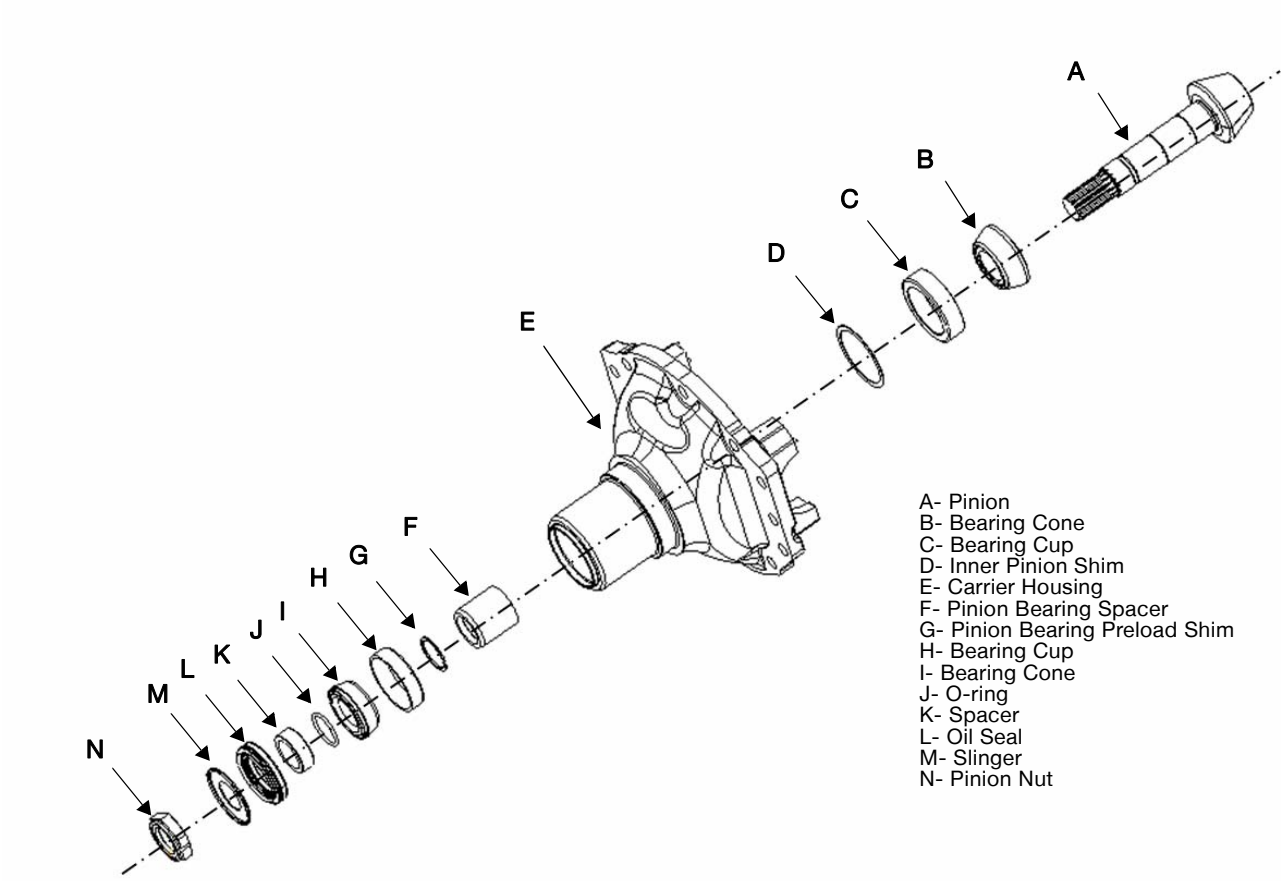


FIGURE 55:

1. Assemble bearing cone (B) to pinion (A):

a. Place inner shim(s) (D) under bearing cup (C) to set pinion height. If the original pinion is being used, use the original shims, or install new shims the same thickness as original shims.

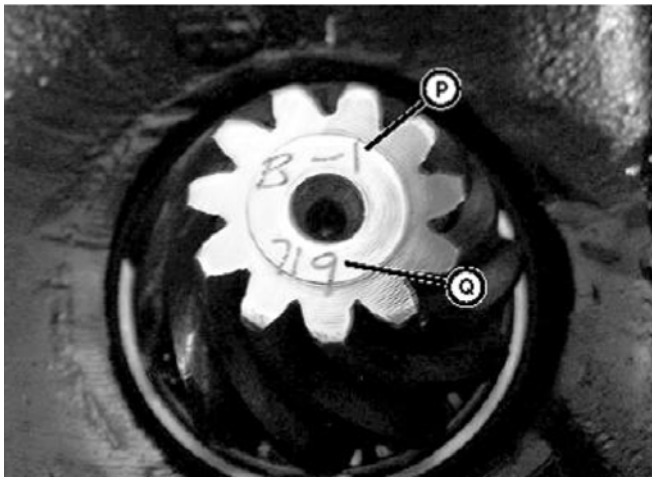


FIGURE 56:

b. If ring and pinion are being replaced, notice the (+) or (-) number (P) on end of pinion gear. This indicates the best running position of each particular gear set in thousandths of an inch. If the number on the new set is not the same as the number on the one being replaced, adjust the height by adding or removing inner shim(s) (B) from original shim pack according to dimension etched in head of pinion.

Example: If the old pinion reads +2 and the new pinion is marked -1, add 0.003 in. shims to the original pack.

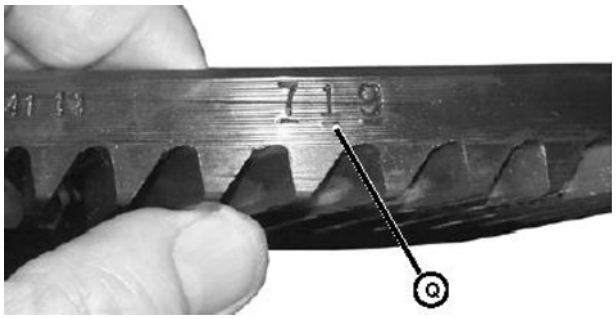


FIGURE 57:

NOTE:

Number (Q) on pinion and ring gear indicate matched set. Make sure numbers on ring and pinion gears match before assembling.

c. Assemble the inner bearing cup (C) and any shims (D) in the carrier housing (E).

d. Install the pinion (A) in the carrier housing (E) and install the spacer (F), outer shim (G), bearing cup (H), bearing cone (I), o-ring (J), spacer (K), oil seal (L), slinger (M) and pinion nut (N).

2. Tighten the old pinion nut to 190–210 lbs. ft. [257–285 N•m].
3. Check the rotation of the pinion.
   a. Verify the pinion rotation torque is 10-15 lbs. in. [1.13–1.69 N•m].
   b. If the pinion does not turn within specification, adjust the shim pack. Add shims if rotation torque is too high, remove shims if rotation torque is too low.
4. When the pinion is shimmed correctly, replace the old pinion nut with a new pinion nut.
5. Tighten the new pinion nut to 190–210 lbs. ft. [257–285 N•m] and recheck the rotation of the pinion.

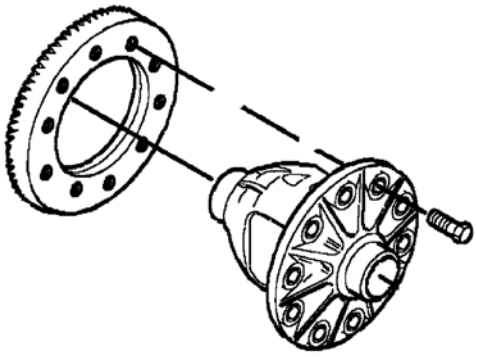


FIGURE 58:

6. Install the ring gear to the differential case.
7. Tighten the ring gear bolts to 58–65 lbs. ft. [79–88 N•m].

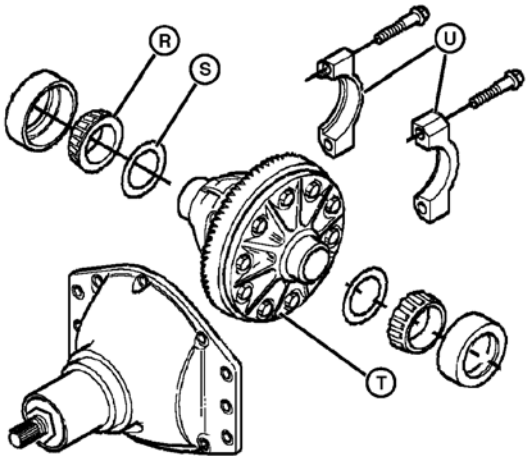


FIGURE 59:

⚠CAUTION

There may be several shims on each differential case. Whatever shim thickness is added to one side of the differential case must be removed from the other side. Or, whatever shims are removed from one side must be added to the other to keep bearing preload from changing.

8. If bearings (R) were removed, place original shims (S), or new shims equaling the same thickness, on the same side of the differential assembly (T) from which they were removed.
   a. The bearing shim(s) (S) control the ring and pinion backlash and the preload of the differential bearings. If the original differential case, bearings, and gear set are being used, install the original shims or new shims totalling the original thickness.
   b. If the differential case bearings or gear set are being replaced, set the bearing preload and gear backlash by adding or removing shim(s) between the ring gear side bearing and differential case.
   c. Shim the bearings until preload is 0.001–0.004 in. [0.03–0.09 mm].
9. Install new bearings on the differential assembly.
10. Using marks made during disassembly, install the bearing caps (U) in their original positions.
11. Tighten the capscrews for the bearing caps to 40–50 lbs. ft. [54–68 N•m].
12. Install the differential case assembly to the carrier housing.
13. Check gear backlash with a dial indicator to 0.004–0.008 in. [0.10–0.20 mm].
14. Ensure old Loctite on axle housing and carrier has been removed properly.
15. Apply Loctite 5188 or Loctite 515 to the axle housing.
16. Install the carrier housing to the axle housing.
17. Apply Loctite 262 to all capscrews securing the carrier housing.
18. Tighten the capscrews to 74.4–79.6 lbs. ft. [101–108 N•m].

Pinion Depth Setup & Adjustment:

NOTE:

This procedure is required only if a new gear set is being installed.

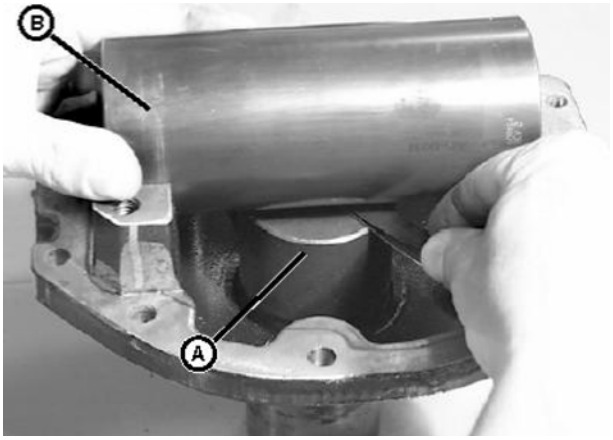
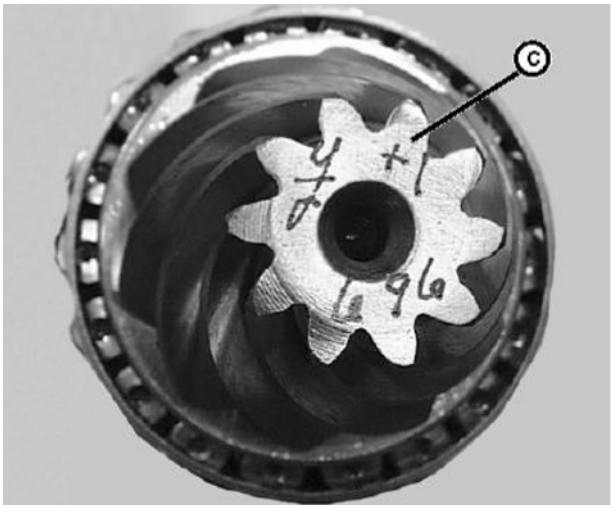


FIGURE 60:

Tools Required:

- JDG 1395A Differential Setup Tool Kit

1. Remove inner pinion bearing cup (if installed) and retain any shims for possible reuse.
2. Install tool (A) into pinion bearing bore.
3. Install tool (B) across differential bearing saddles.
4. While holding the tool (B) down, measure the distance between the two tools with a feeler gauge. [This value will generally be between 0.026–0.034 in. [0.64–0.86 mm], but it is acceptable to have measurements between 0.018–0.038 in. [0.45–0.96 mm]. Record the measurement.



5. Locate the (+) or (-) number (C) on the end of the pinion gear. This number indicates the best running position of each particular gear set in thousandths of an inch.
6. The shim pack thickness to be used under the pinion bearing cup is calculated as follows:
   a. Use the feeler gauge thickness dimension measured in previous ‘distance measuring’ step.
   b. If the number on the pinion is a (+) number, SUBTRACT that number in thousandths of an inch from the feeler gauge thickness dimension measured in previous ‘distance measuring’ step.
   c. If the number on the pinion is a (-) number, ADD that number in thousandths of an inch to the feeler gauge thickness dimension measured in previous ‘distance measuring’ step.
   d. After calculating shim pack thickness, assemble a shim pack measuring the exact amount calculated above and place it under the pinion bearing cup.

Differential Bearing Preload:

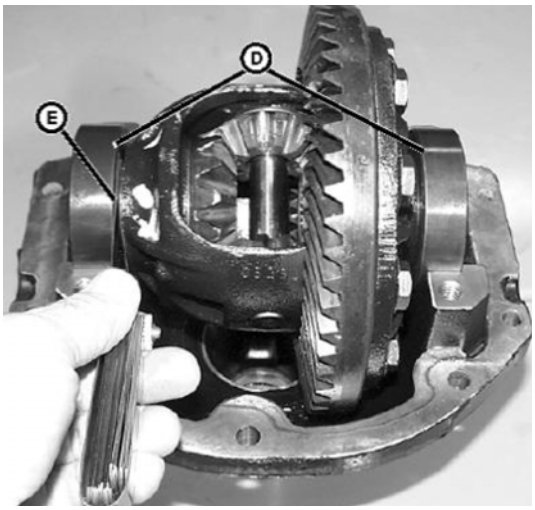


FIGURE 61:

1. Place the bearing substitute tool (D) on each side of the differential case.
2. Pry the differential back and forth with a small bar to seat the bearing tools against the outer edges of bearing bores.
3. Pry the differential all the way over against one of the bearing tools.
4. Using a feeler gauge, measure the gap between the differential carrier and the bearing tool (E). Record the measurement.
5. Add 0.001–0.004 in. [0.03–0.09 mm] to the measurement for bearing preload.
6. Assemble a shim pack measuring the exact amount as the calculation above.

Differential Backlash Adjustment:

NOTE:

Pinion shaft assembly must be installed.

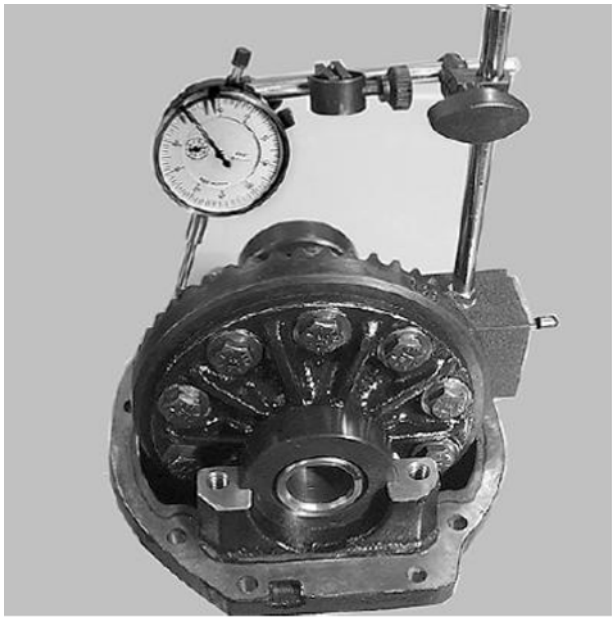


FIGURE 62:

1. Install pinion shaft. (See “Carrier Assembly & Installation”, on page 19.)
2. Divide the shim pack and a bearing substitute tool on each side of the differential case.
3. Install dial indicator to measure ring gear movement.
4. Hold the pinion gear shaft to keep it from moving.
5. Rotate the ring gear back and forth and observe readout on dial indicator is to specification of 0.004–0.008 in. [0.10–0.20 mm].

⚠CAUTION

Whatever shim thickness is added to one side of the differential case must be removed from the other side. Or, whatever shims are removed from one side must be added to the other to keep bearing preload from changing.

   a. If necessary, adjust backlash. Gear backlash is adjusted by changing the shim pack thickness on the ring gear side bearing. Removing shims increases backlash; adding shims decreases backlash.
   b. When backlash is correct, removing bearing substitute tools and install bearings.
6. Install the bearing caps.
7. Tighten the capscrews for the bearing caps to 40–50 lbs. ft. [54.2–67.8 N•m] and recheck backlash.

Wheel End Installation

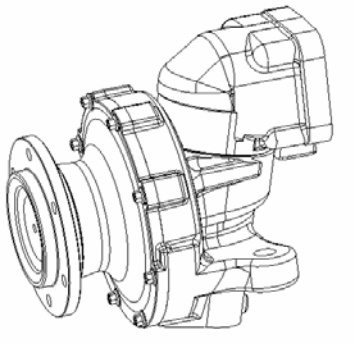


FIGURE 63:

1. Ensure old Loctite on axle housing and shoulder has been removed properly.
2. Apply Loctite 515 to the shoulder housing.

NOTE:

Washers used to fasten shoulder housing to axle housing are special hardened washers.

3. Apply Loctite 262 to the threads and install capscrews fastening the shoulder housing to the axle housing.
4. Tighten the capscrews to 210.2–231.5 lbs. ft. [285–314 N•m].

Tie Rod Installation

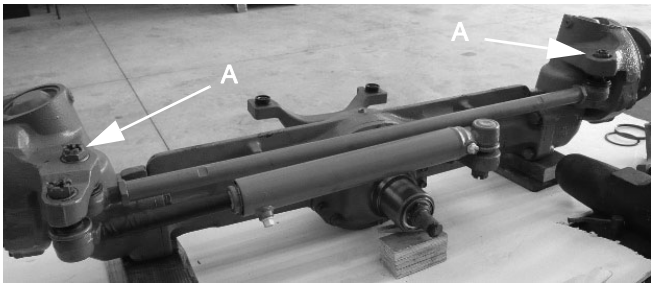


FIGURE 64:

1. Inspect tie rod end boots, replacing boots as needed.
2. Insert tie rod ends into holes in knuckle arms.
3. Install two castle nuts to tie rod ends.
4. Tighten castle nuts (A) to 99.5–110.6 lbs. ft. [135-150 N•m].

NOTE:

Only grease tie rods if grease zerk is present.

5. Install cotter pins. If slots in castle nuts do not align with holes after torquing, tighten nuts until next slot aligns.
6. Lubricate tie rod ends using general purpose grease.
7. Adjust toe-in. (See “Toe-in Adjustment”, on page 24.)
8. Install wheel and tire to final drive.

Steering Cylinder Installation

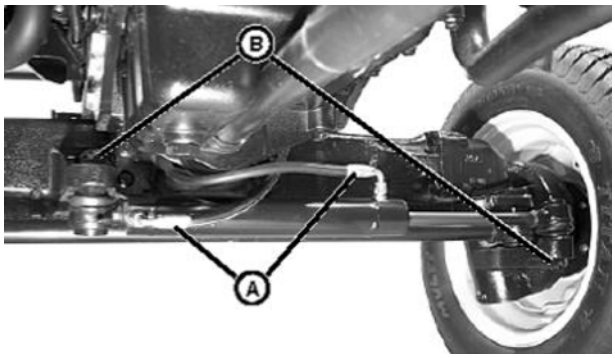


FIGURE 66:

1. Inspect rubber boots on ends of cylinders. Replace boots if necessary.
2. Install cylinder and tighten castle nuts to 84.8–94.4 lbs. ft. [115–128 N•m]. If slots in castle nut do not line up with cotter pin hole, continue tightening nut until next slot lines up.

Axle Trunnion Installation

1. Raise front axle off ground to take weight off the front axle.

NOTE:

Ensure the inverted v-seal is installed inside the rear trunnion bore (A) before proceeding.

Assemble Rear Trunnion

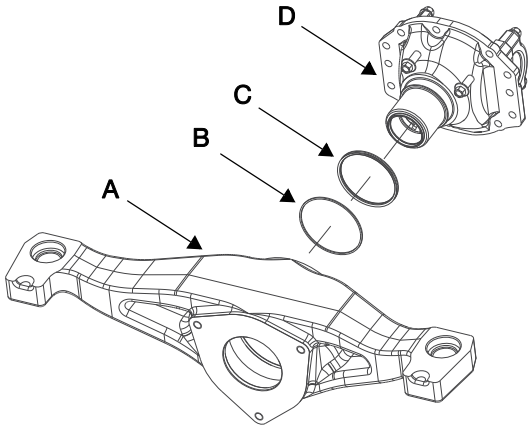


FIGURE 67:

2. Install thrust washer (B) on rear trunnion (A). It might be necessary to apply grease to thrust washer to hold it in place.
3. Install v-ring seal (C) on carrier pin (D).
4. Slide rear trunnion (A) on carrier pin (D).
5. Grease the rear trunnion grease zerk until grease purges from the v-ring.

Assemble Front Trunnion

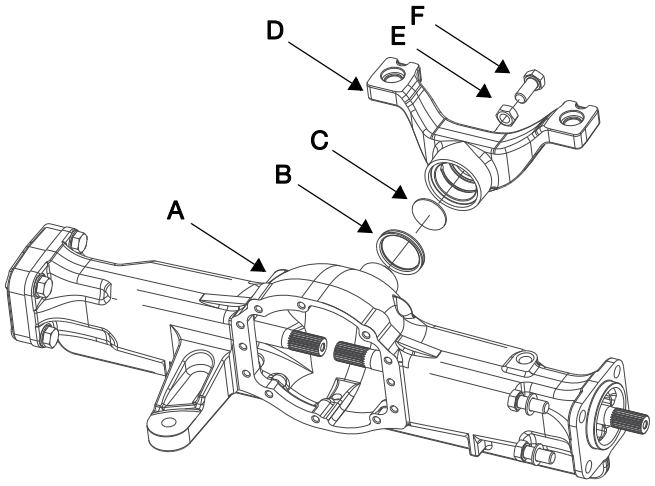
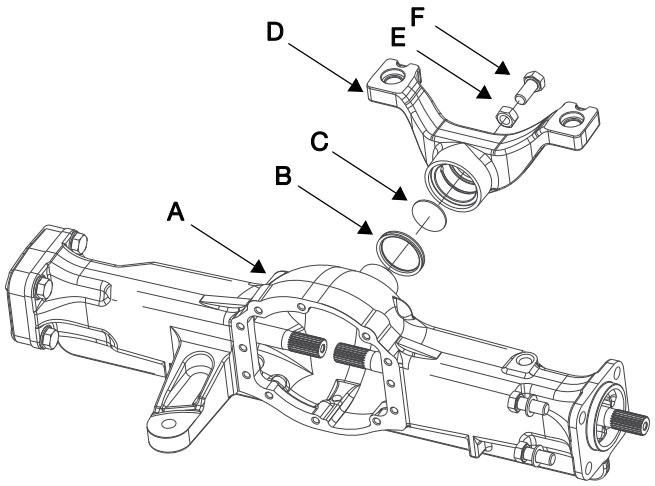


FIGURE 68:

6. Install thrust washer (C) on front trunnion (D). It might be necessary to apply grease to thrust washer to hold it in place.
7. Install v-ring seal (B) on axle pin (A).
8. Slide front trunnion (D) on axle pin (A).
9. Grease the front trunnion grease zerk until grease purges from the v-ring.

Axle Installation & End Play Adjustment



1. Install axle into vehicle.
2. Install front trunnion hex nut (E) loosely on bolt (F).
3. Thread bolt (F) into front trunnion (D) and tighten to 24 lbs. ft [32 N•m].
4. Tighten back the hex nut (E) until tight against front trunnion (D).

Toe-in Adjustment

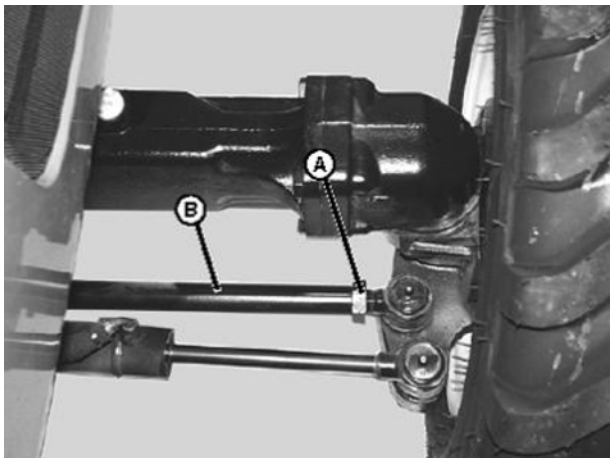


FIGURE 69:

NOTE:

This procedure is for toe-in adjustment off the vehicle. The toe-in adjustment must be performed again on the vehicle.

1. Jack up front axle so tires are off floor.
2. Rotate tire by hand and scribe a line near the center of each of the front tires.

NOTE:

One of the tie rod ends and jam nut has left-hand threads.

3. Measure and record the distance between the lines at the front and the rear of the tire at about axle height. The front measurement should be less than the rear measurement.
4. If measurement is not correct, loosen jam nuts (A) on both ends of tie rod and turn the tie rod (B) using a wrench to increase or decrease the amount of toe until the measured dimension is 0–0.125 in. [0–3 mm].
5. Apply Loctite 262 and tighten the jam nuts (A) to 173–192 lbs. ft. [235–260 N•m].

Driveshaft & Hydraulic Line Installation

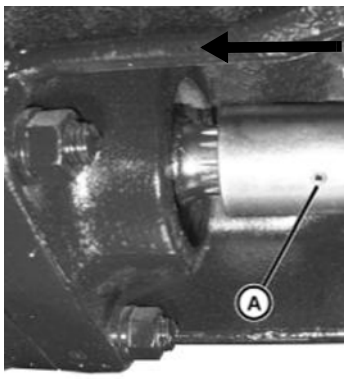


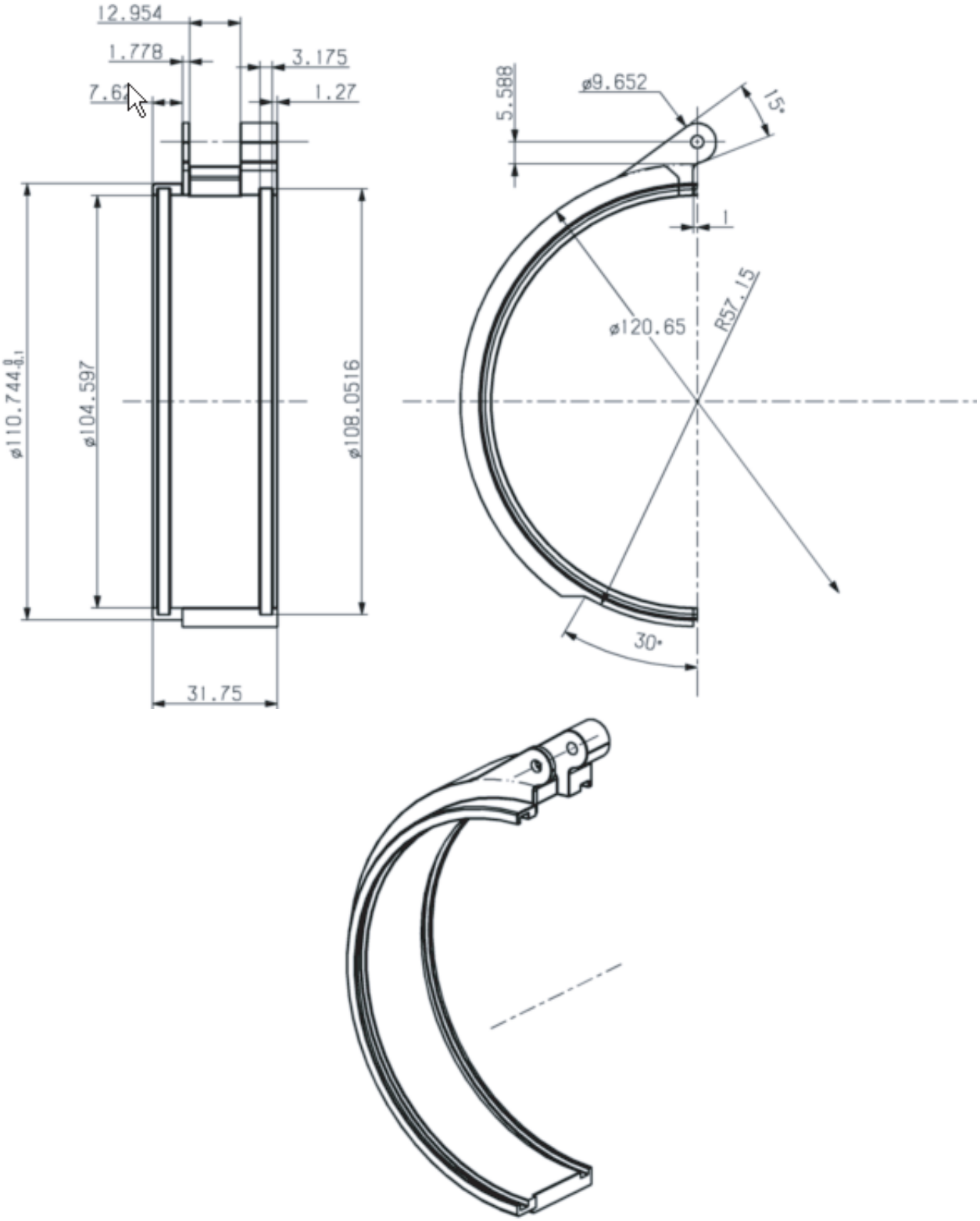
FIGURE 70:

1. Position driveshaft onto machine. While supporting drive shaft, slide splined connector toward machine.
2. Install spring pin (A) to drive shaft splined connector.
3. Connect steering cylinder hydraulic lines.

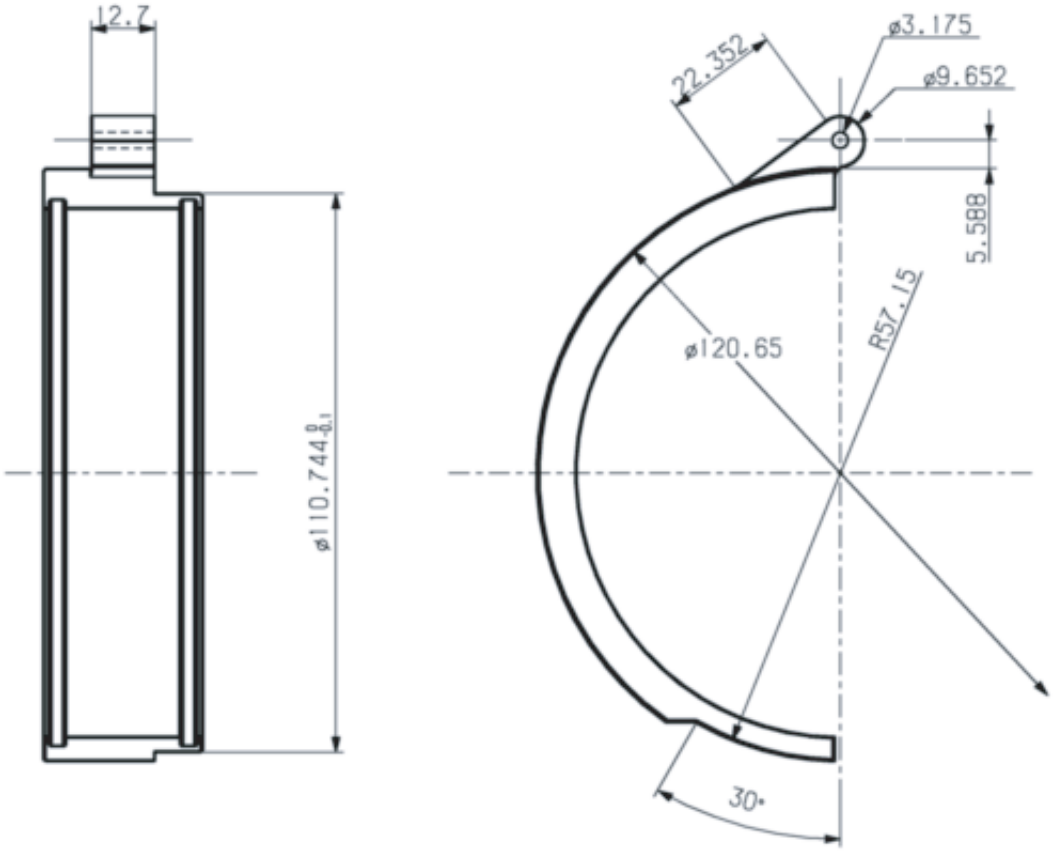
SPECIAL TOOLS

Face Seal Tool

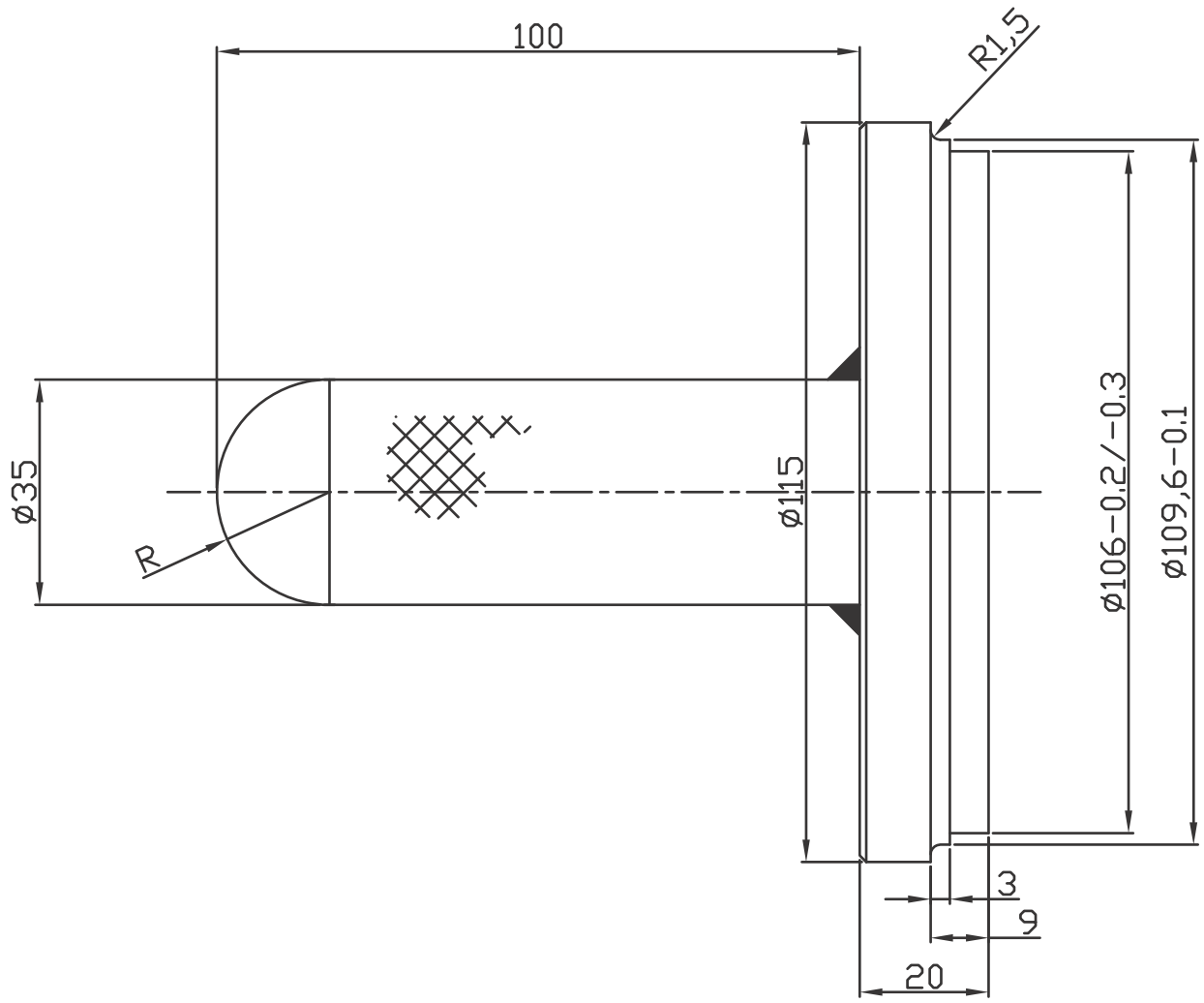
Left-Hand Side



Right-Hand Side

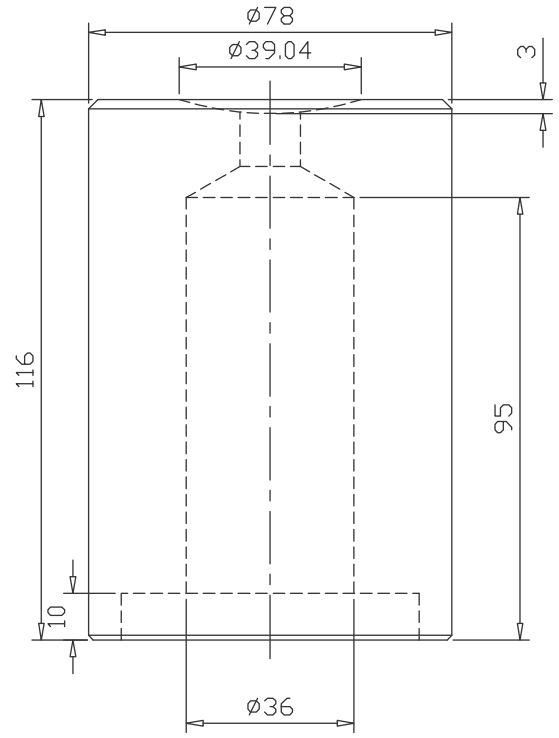


Face Seal Cup Driver

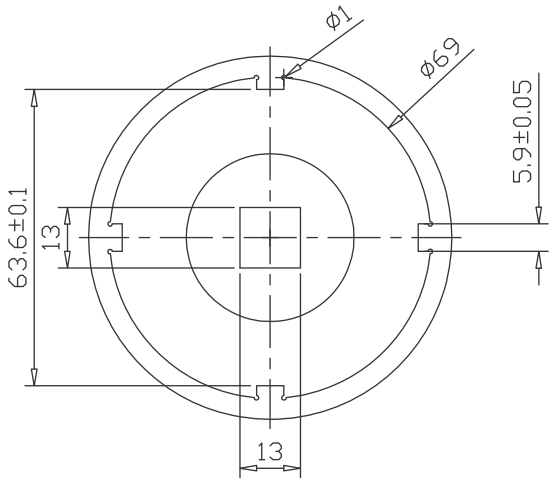


DOLLY FOR FACE SEAL
CUP PRESSING
MATL; MS
QTY; 1NO.

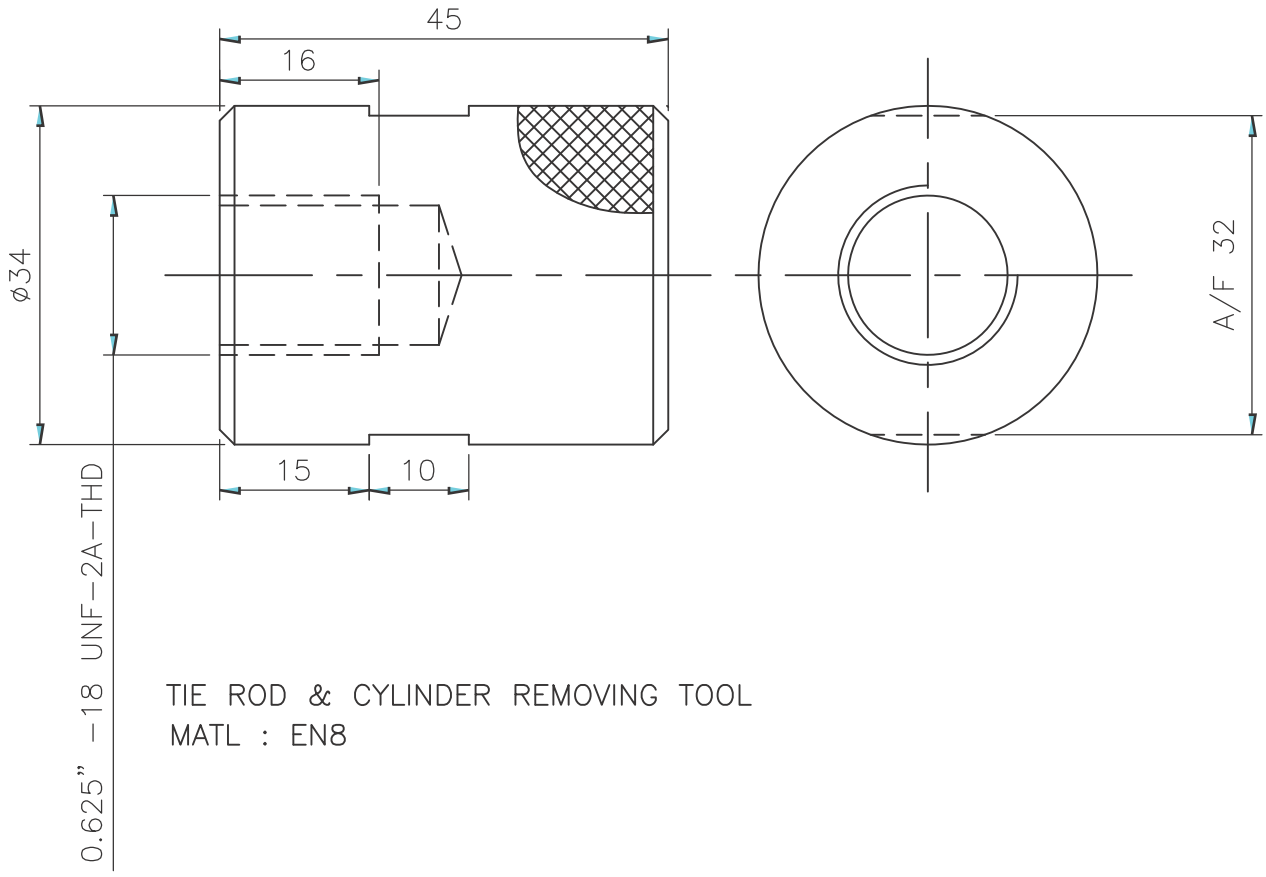
Final Drive Spanner Nut Socket



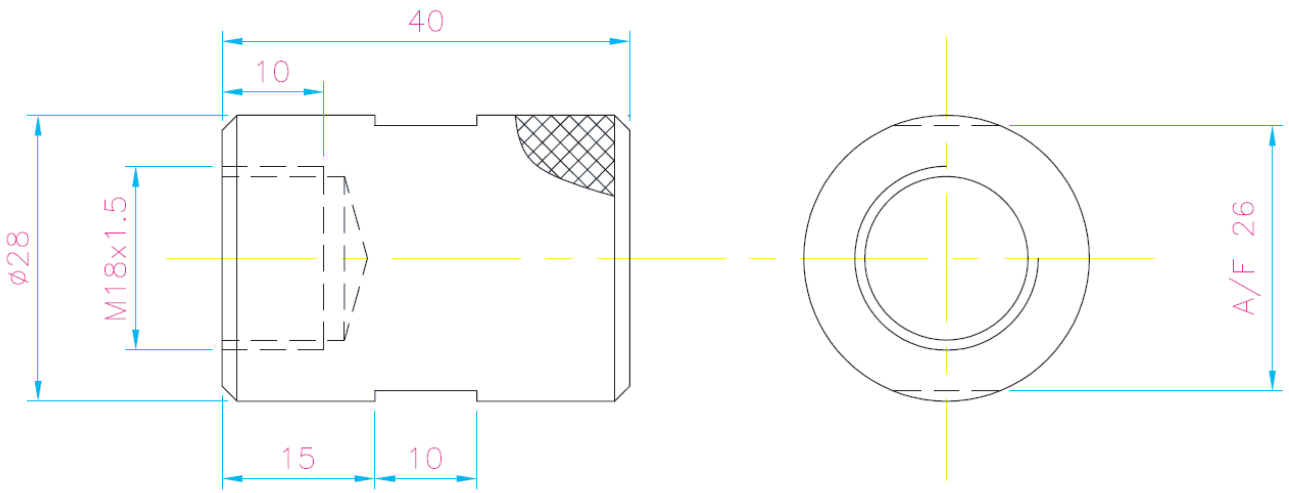
01
SOCKET
MATL; EN-8 TOUGHENED
QTY; 2NOS
PINION NUT TORQUING SHOULDER
WO-055-10



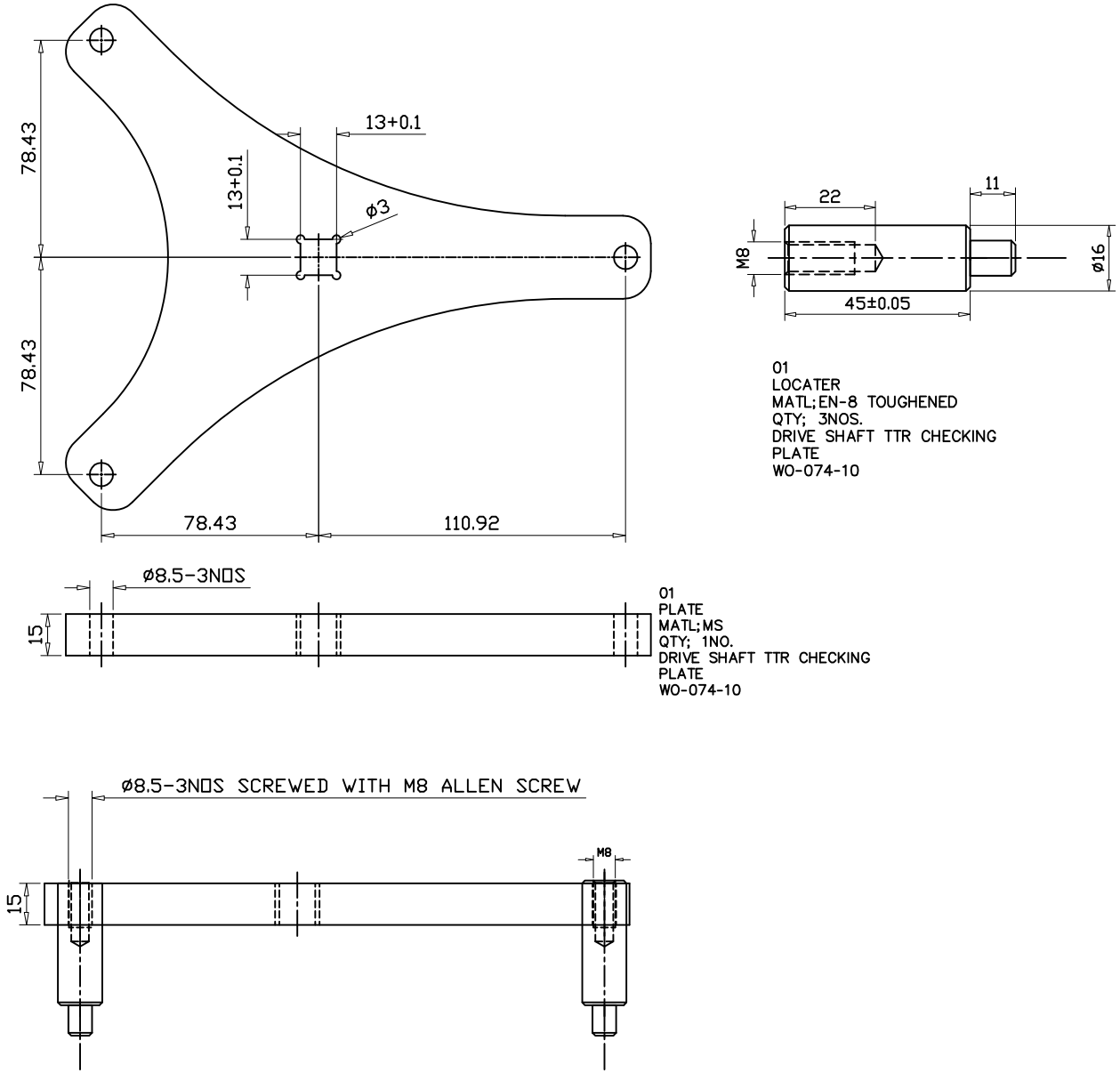
Steering Cylinder Taper Removal Tool



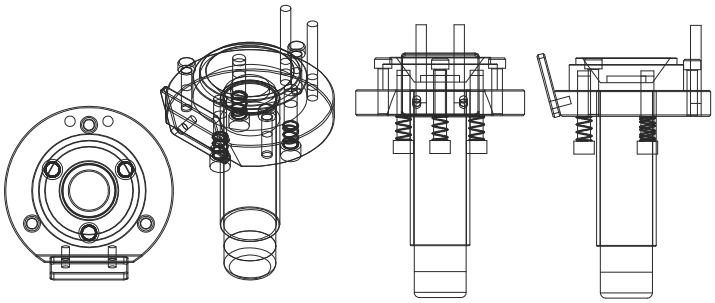
Tie Rod End Taper Removal Tool



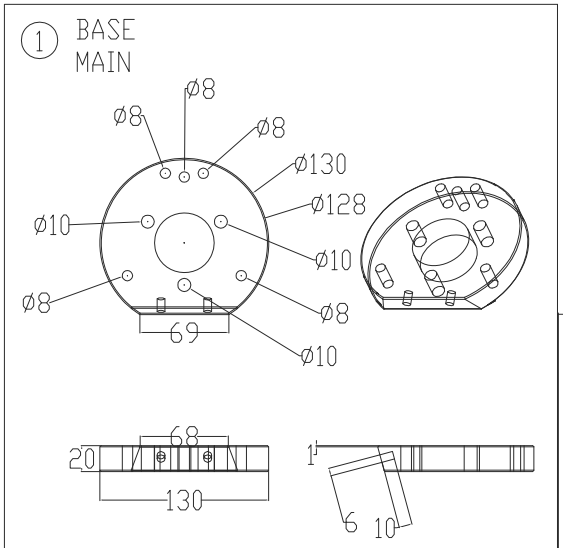
Final Drive Bracket Tool

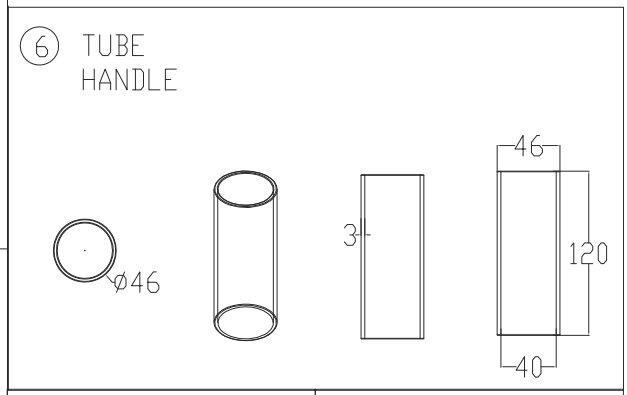


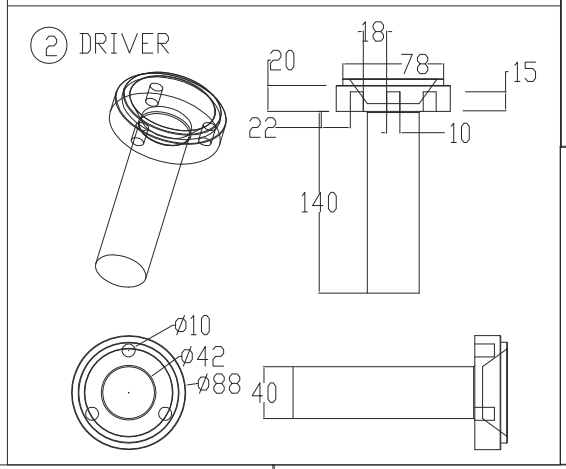
Welch Plug Driver Tool

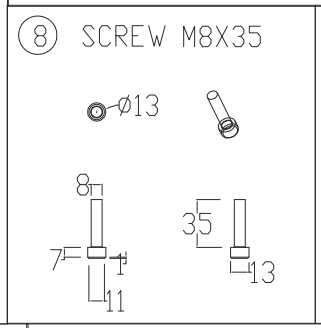


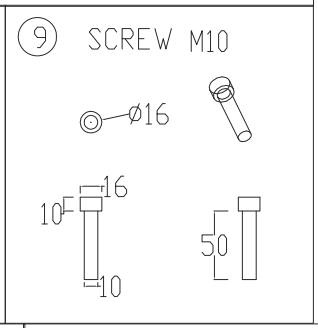
NO. SR.	DESCRIPTION	QTY	MATL	REMARK
09	SCREW M10	03	MS	--
08	SCREW M8	03	MS	--
07	STOP	01	MS	--
06	TUBE HANDLE	01	MS	--
05	STUD	02	MS	--
04	MAGENT	01	MS	--
03	BUMPER	01	MS	--
02	DRIVER	01	MS	--
01	BASE MAIN	01	MS	--

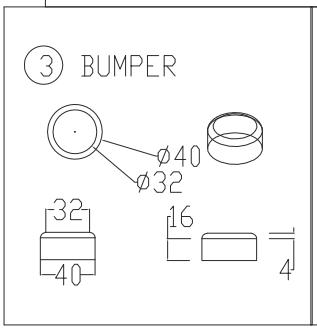


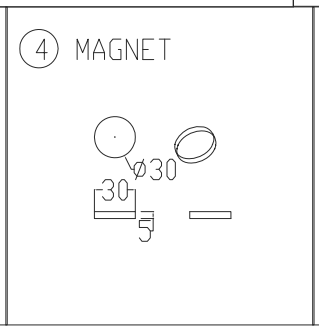


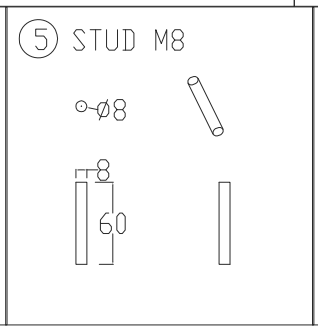


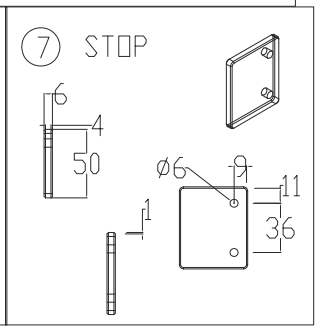












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